



FIG.1-1

VAP-1 amino acid sequence (SEQ ID NO:1)

MAVLAVLLACLERAQAQFGCSNTKINDQARKMFYDAHNDARRSMAKGLE
PNKCGLLSGGKNVYELNWDCEMEAKAQEWADGCPSSFQTFDPTWGQNYATYM
GSIADPLPYASMAVNGWWSEIRTVGLTDPDNKYTNSAMFRFANMANGKASAFG
CAYALCAGKLSINCIYNKIGYMTNAIIEYKGDACSTDACECTTYSDSQCKNGLCYK
APQAPVVEFTMCPSVTDQSDQARQNFLDTHNKLRTSLAKGLEADGIAAGAFAP
MAKQMPKLVKYSCTEANARTWAKGCLYQHSTSAQRPLGENLYMISINNMP
KIQTAEEDSSKAWWSELKDFGVGSDNILTQAVFDRGVGHYTMAWEGTTEIGCF
VENCPTFTYSVCQYGPAGNYMNLITYTKSPCTADADCPGTQTCSVAEALCVIP

vap-1 cDNA nucleotide sequence (SEQ ID NO:2)

ATGGCGGTATTAGCAGTGGTACTACTTCTAGCATGCCCTGGAGAGCGGTTG
CACAGACGTTCCGGCTGCTCTAACACCAAGATCAATGACCAGGCTCGTAAGAT
GTTCTATGATGCTCACAAATGATGCAAGACGAAGCATGGCTAAAGGGCTTGAG
CCAAACAAGTCCGCACTCTTATCTGGTGGAAAGAAATGTTTATGAATTGAATT
GGGATTCCGAGATGGAAGCAAAAGCTCAGGAATGGGCAGACCGATGTCCCA
GCTCTTTCAGACATTTGATCCCAACATGGGGCAGAACTACCGGACGTACAT
GGGATCGATTGCTGATCCGCTTCCATACGCTTCCATGGCTGTTAATGGGTGGT
GGTCGGAAATTAGAACCGTAGGACTTACGGATCCTGATAACAAGTACACTAA

To Fig.1-2

FIG.1-2

FROM Fig.1-1

CAGTGCAATGTTCCGATTTGCTAATATGGCAAAATGGTAAAGCTTCAGCTTTTG
GATGTGCATACGCGTTGTGCGCAGGAAAACATATCCATCAATTGCCATTTACAA
CAAGATAGGATACATGACCAATGCTATCATTTATGAAAAGGAGATGCCCTGT
ACCAGTGACGCTGAATGCACCACCTACTCAGACTCACAAATGCCAAAACGGTC
TTTGCTATAAGGCACCTCAAGCTCCAGTCGTTGAGACTTTCACAAATGTGCCCT
TCGGTCACGGACCAAGTCGGATCAGCGCGTCAAAACTTCTTGGACACCCATA
ACAAATTGCGTACAAGCCTTGCCAAGGACTTGAAGCTGATGGAATTGCCCGC
TGGAGCAATTGCACCAATGGCCAAGCAATGCCAAAACCTGGTAAATACAGC
TGCACAGTTGAAGCAACGCCAGAACATGGGCAAAAGGATGCCTTTACCAGC
ATTCAACAAGCGCACAGAGACCAGGACTCGGTGAAAATCTTTATATGATCAG
CATTAAACAATGCCCTAAAATTCAACCGGAGGACTCCTCAAAGGCTTGG
TGGTCCGAGTTGAAAGACTTCGGAGTCGGTTCTGACAACATTTCTGACCCAAAG
CAGTTTTTGATCGTGGCGTTGGACATTACACACAAATGGCATGGGAAGGAAC
TACTGAAATTGGATGTTTTGTGGAGAAATGTCCAACATTCACTTATTCGGTAT
GCCAATATGTTCCAGCGGGAACACTACATGAACCAACTAATCTATACCAAGGG
CTCACCATGCACAGCTGACGCCGATTGCCAGGAACCCAGACATGCAGTGTC
GCTGAAGCATTTATGTTATCCCTTAGTAAATTTTCTATGCAACTCTTTGAAA
GTCATAATAAATATGCAAAAATTAAAAAAA

To Fig.1-3



COPY OF PAPER
ORIGINALLY FILED

2/12

10051644.000502



FIG.1-3

FROM Fig.1-2

VAP-2 amino acid sequence (SEQ ID NO:3)

MNVLSAVTLFLIFRYAQTVNIEGSGNDELLEQNVWNDVDDKVVEALGGLDD
ELLTEHVCNKSTITLQKEIILTTNELLRRSLAFGKQRNKRGLMNGARNMYKLD
WDCELASLAANWSTSCPQHFMPSVLSNAQLFKRFYFYFDGHDSTVHMRNA
MKYWWQQGEEKGNEDQKNRFYARNYFGWANMAKGKTYRVGCSYIMCGDG
ESALFTCLYNEKAQCEKEMIYENGKPCCEDKDCFTYPGSKCLVPEGLCQAPSMV
KDDGGSFQCDNSLVSDVTRNFTLEQHNFYRSRLAKGFEWNGETNTSQPKASQM
IKMEYDCMLERFAQNWANNVCFAHSAHYERPNNQQNL YMSSFNPDPRSLIHT
AVEKWWQEELEEFGTPI DNVLTPELWDLKGKAIGHYTQMAWDRTYRLGCGIANC
PKMSYVCHYGPAGNRKNNKIYEIGDPCVEDDDCPIGTDCEKTTSLCVISK

vap-2 cDNA nucleotide sequence (SEQ ID NO:4)

ATGAACGTGGTCCTTTCGGCTGTCACCTCTTTTCTTATTTTCGATATGCGCAG
ACTGTGAATATAGAGGCAGTGGAGGAATGATGAGCTTCTTGAGCAGAACG
TGTGGAACGATGTAGACGACAAGTTGTAGAGCACTTGGTGTCTTGATGA
TGAAGTCTAACCGAACAATGTGTGTAAACAAATCAACGATCAGCTACAG
CAGGAGATCATCTTGACAACCCACAATGAATTACGAAGATCATTTGGCTTTCG
GAAAGCAAGAAACAAGAGAGGTCTCATGAACGGTCCGAGAAATATGTATA
AACTGGATTGGGATTGTGAAGTGGCATCAGTTCAGCCAAATTGGTCAACCTCC
TGCCCTCAGCACTTTATGCCGCAATCGGTACTTGGCTCCAACGCTCAGCTTTT

To Fig.1-4



COPY OF PAPERS
ORIGINALLY FILED

4/12

10051644.080502

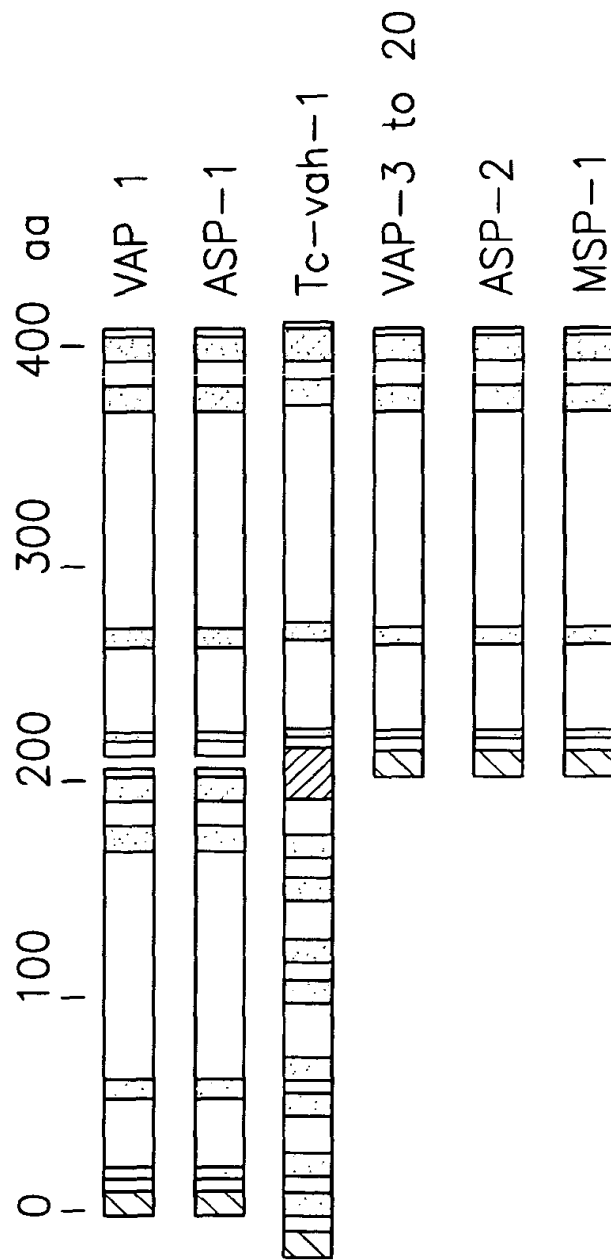
FIG. 1-4

FROM Fig. 1-3

TAAGCGTTTCTATTTTATTTTATGGGCACGACTCTACTGTACATATGCGAA
ACCGATGAAGTATTGGTGCAGCAAGGTGAAGAAAGGCAATGAGGATC
AGAAAAATAGATTCTATGCCAGACGAAATTATTTGGATGGCAACATGGC
AAAGGAAAAACATATCGAGTTGGATGCTCGTATATTATGTGGCGGACGGT
GAATCTGCACTTTTCACTTGTCTTTTATACGAAAAAGCCCAATGCGAAAAAG
AAATGATTTACGAAAAATGGAACCCCTGCTGTGAGGATAAAGACTGTTTCAC
ATATCCAGGATCAAAATGTTTAGTACCTGAAGATTATGTCAAGCACCTTCTA
TGGTAAAGGATGATGGAGGAAGTTTCCAAATGTGATAACTCCCTTGTGTCAGA
TGTACCCCGCAATTTACACTTTGGAGCAACACAATTTTATAGATCTCGTCTTG
CAAAAGTTTTGAATGGAAATGGAGAAACAACACACTTCCCAGCCCAAGGCTAG
TCAAATGATCAAAATGGAGTATGACTGCAATGTTGGAACGGTTTGCACAAAAC
TGGGCAAAATAATTGCGTTTTTGCACACTCGGCACATTACGAAAGACCCGAATC
AGGGTCAGAAATCTACATGAGTTCTTCTCAACCCCTGATCCTAGAACCTT
ATACATACGGCCGTCGAGAGTGGTGGCAGGAATTGGAGGAGTTCGGTACTC
CAATTGATAACGTTCTGACACCCGAATTGTGGGATTTGAAAGGAAAGCGAT
AGGACATTACACTCAGATGGCCTGGGATCGTACTTACCGTCTTGGTTGTGAA
TCGCAAACTGTCCGAAGATGTCGTACGTGGTTTGTCACTATGGGCCAGCAGG
CAACAGAAAGAACATAAAATCTATGAAATCGGGATCCTTGCGAAGTCGAT
GATGATTGCCCGATTGGAACAGATTGTGAAAGACAACTTCTTTATGTGTGAT
CTCAAAATAA

FIG.2

Schematic diagram of nematode venom allergen protein domains



5/12

COPY OF PAPERS
ORIGINALLY FILED



10051644.080502



COPY OF PAPERS
ORIGINALLY FILED

6/12

10051644 . 000502

FIG.3-1

CLUSTAL W Alignment of VAP-1, VAP-2, and selected other nematode VA proteins.

VAP-1N	1	-----MAVLAVVLLACLER	VAQTFG	22
VAP-1C	1	-----PQAPV	VETFTM	11
VAP-2N	1	MNVLSAVTLFLIFRYAQTVNIEGSGNDELLEQN	VWVDVKVVEALGGLDEL	TEHV 60
VAP-2C	1	-----	-----SFQ	3
ASP-1N	1	-----MFSPVIVSVIFT	IAFCDASP	RDGFG 26
ASP-1C	1	-----	-----DVPETN	QQ 8
VAP-3	1	-----	-----MNYLLLV	VALAVG 13
MSP-1	1	-----	-----MSNKLII	SILITI 14

VAP-1N	23	CSNTKIN	--DQARKMFYDA	HNDARRSMAKGL	EPN	---KCGLLSGGKIN	IVYELN	---WDCE	MEA 76				
VAP-1C	12	CPSVT	--DQS	DQARQN	FLDT	HNKLRTSL	AKGLEADG	IAAGAFAPMAKQ	MPKLVKYSCT	VEA 70			
VAP-2N	61	CNKST	--ITQLQ	QEIL	TT	HNELRSL	AFGKQRN	---KRGLMNGAR	MYKLD	---WDCE	LAS 114		
VAP-2N	4	CNSLV	--SDV	TRNFT	LEQ	HNFYRSRL	AKGFEWNG	---ETNTSQPKASQ	MIKME	---YDC	MLER 59		
ASP-1N	27	CNSG	--ITDKR	QAF	LD	FHNARRRV	AKGVEDS	---NSGKLNPAKIN	MYKLS	---WDCA	MEQ 80		
ASP-1C	9	CPST	--GMT	DSVRD	TFLSV	HNEFRSSV	ARGLEPD	---ALG	GNAPKAAKML	KMV	---YDCE	VEA 64	
VAP-3	14	CSADFG	---	SSGQNG	II	NAHNTLR	SKI	AKGT	YVA	---KGTQKSPG	TNLLKMK	---WD	SAVA 66
MSP-1	15	ITYTVNSL	ITVPEQ	NAVVD	CI	NKYRSQ	LANGK	TKN	---KNGGNF	PSGKD	ILEVS	---YSKD	LEK 71

To Fig.3-2



COPY OF PAPERS
ORIGINALLY FILED

7/12

10051644.000502

FIG.3-2

FROM Fig.3-1

VAP-1N	77	KAQEWADGCPSSFQT--FDPT---	WGQNYATYMGSI--ADPLPYASMAVNGWSE	IRTVG	129
VAP-1C	71	NARTWAKGCLYQHSTSAQRPG	---LGENLYMISINN--MPKIQTAEDSSKAWWSEL	KDFG	125
VAP-2N	115	LAA NWS TSC PQH MPQSVLGS	---NAQLFKRFYFYFDGHDSTVHMRNAMKYWWQQCEEKG		171
VAP-2C	60	FAQNWANNVCFAHSAHYERPNI	---QGQNL YMSSFSN--PDPRSLIHTAVEKWWQEL	LEEF	114
ASP-1N	81	QLQDAIQSCPSAFAG---IQG---	VAQNVMSSWSSGGFPDPSVKIEQTL	SGWWSGAKKNG	134
ASP-1C	65	SAIRHGNKCVYQHS HGEDRPG	---LGENIYKTSVLK--FDKNKAAKQASQLWWNE	LKEFG	119
VAP-3	67	SAQNYANGCPTCHSG---DAG---	LGENLYWWTSGSLGDLNQYGSAAASAWEKE	FQDYG	120
MSP-1	72	SAQRWANKCIFDHNGTDLYSGGKFYGENLY	LDGDFEH-KNITQLMIDACNAWWGE	STTDG	130

VAP-1N	130	LT D-----PDNK--YTNSA---	MFRFANMANGKASAFGCAYALCAGKL	-----S	INCI	172
VAP-1C	126	VGSD---NLTQA--VFDRG---	VGHYTQMAWEGTTEIGCFVENCPTFT	-----Y	SVCCQ	171
VAP-2N	172	NEDQ-----KNR--FYARN--	YFGWANMAKGT YRVGCSYIMCGDGE	-----A	LFTCL	217
VAP-2C	115	TPID---NVL TPE--LWDLKGKA	I GHYTQMAWDRTYRLGCGIANCPKMS	-----Y	VVCH	163
ASP-1N	135	VGPD---N-----KYNNGG--	LFAFSNMVYSETTKLGCA YKVCGTKL	-----A	VSCI	176
ASP-1C	120	VGPS---NVL TTA--LWNRPGMQI	GHYTQMAWDTTYKLGC AVVFCNDFT	-----F	GVCCQ	168
VAP-3	121	WKS---NLM TID--LFNTG---	I GHATQMAWAKSNLIGCGVKDCGRDSNGL	NKVT	VVCCQ	171
MSP-1	131	VPPSWINNFLPTDNKENDEKFEAVGHW	TQMAWAKTYQIGCALKVCHKPD	CNGN--L	IDCR	188

To Fig.3-3



COPY OF PAPERS
ORIGINALLY FILED

8/12

FIG.3-3

FROM Fig.3-2

VAP-1N	173	YNKI	GYMTNA	I	YE	KGDACT	SDAECT	TTYS	--DS	QCKNGL	CYKA	-----	213		
VAP-1C	172	YGPAGN	YMNQL	I	YT	KGSPCT	ADADCP	GTQ	--T	CSVAEAL	C-V	--IP	-----	212	
VAP-2N	218	YNEKAQ	CEKEMI	YE	NGKPCCE	KDCFT	YPGSKCL	VPEGLC	QAPSMV	KDDGG	268				
VAP-2C	164	YGPAGNR	KNKI	YE	I	GDPCEV	DDDCPI	GT	--D	CEKTS	LC-V	--ISK	-----	205	
ASP-1N	177	YNGVGY	ITNQPM	WE	T	GQACKT	GADCST	YK	--N	SGCED	GLCT	TKGP	-----	218	
ASP-1C	169	YGP	CGNYM	GHV	I	YTM	QPCS	---	QCSPGA	--T	CSVTEGLC	S-A	---P	-----	206
VAP-3	172	YK	PQCNFI	NQY	I	YVSGAT	CS	---	GCPSGT	--S	CETSTGLC	V	-----	207	
MSP-1	189	YYP	PGNGM	GSP	I	YQQG	KPAS	---	GCGKAG	--P	STKYSGLC	KPD	PHQNN	-----	231

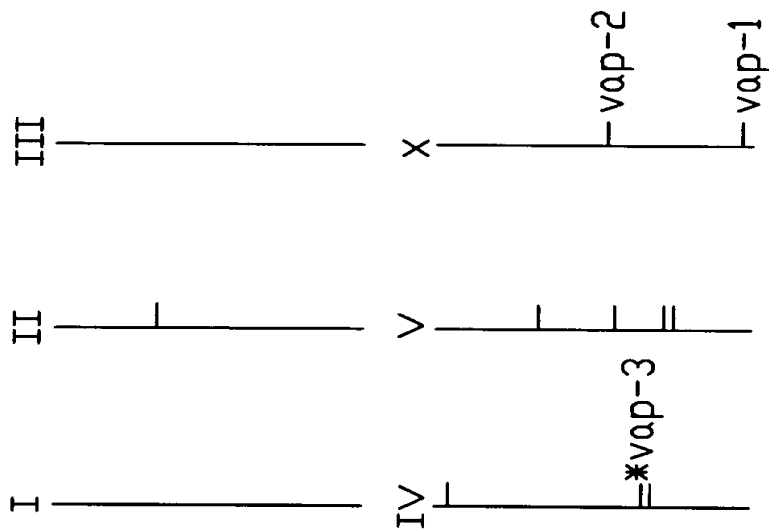


COPY OF PAPERS
ORIGINALLY FILED

9/12

FIG. 4

Schematic map of selected *C. elegans* vap genes





COPY OF PAPER8
ORIGINALLY FILED

10/12

FIG.5B

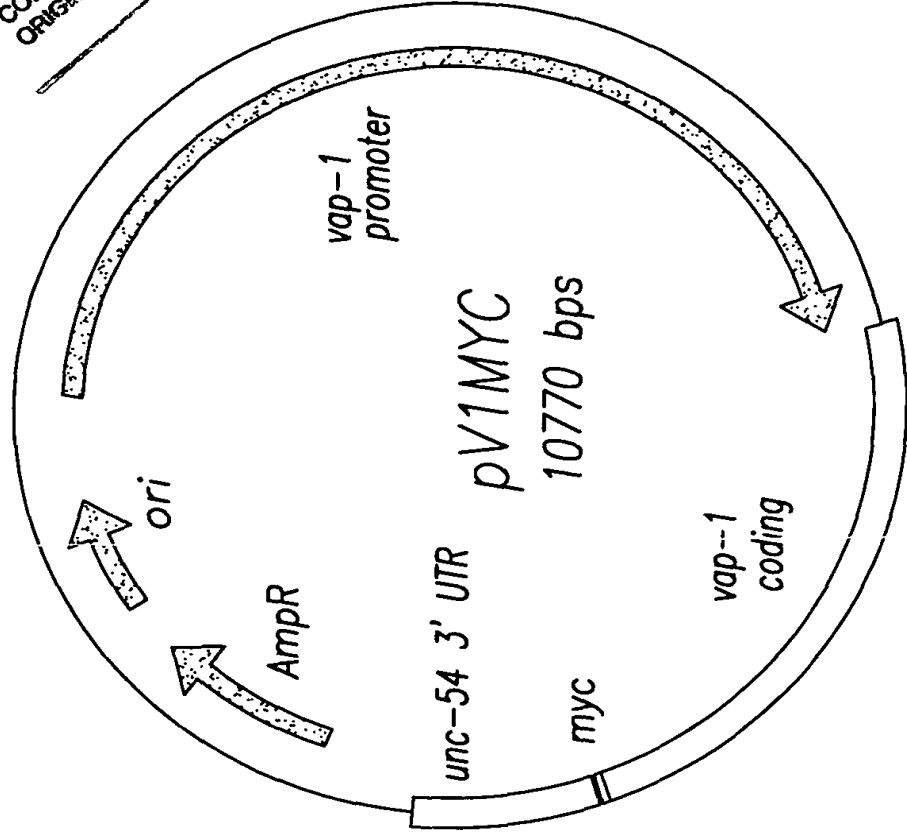
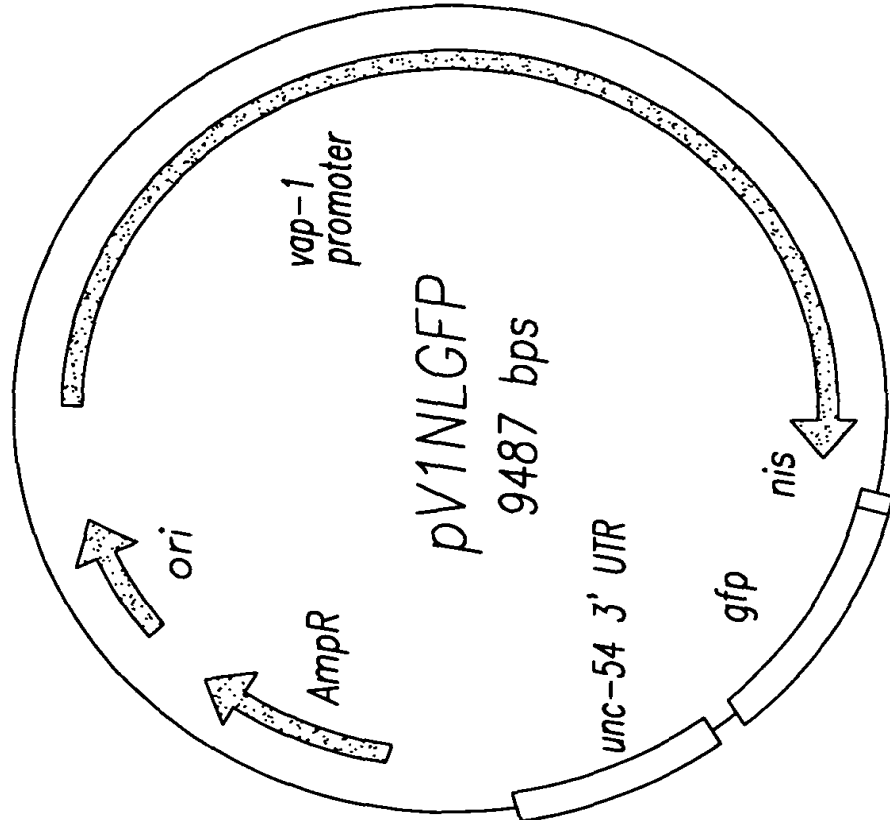


FIG.5A





10051644.020502

COPY OF ~~FIGURES~~
ORIGINALLY FILED

11/12

FIG. 6A

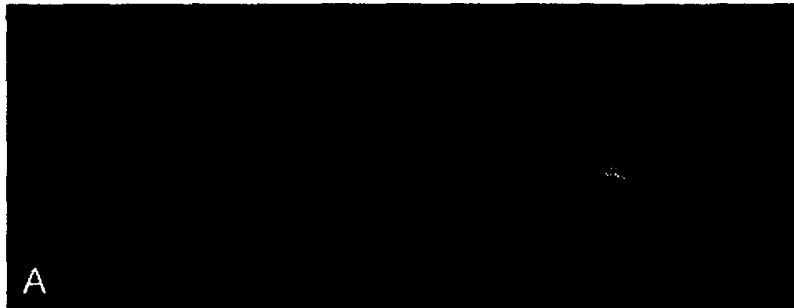


FIG. 6B

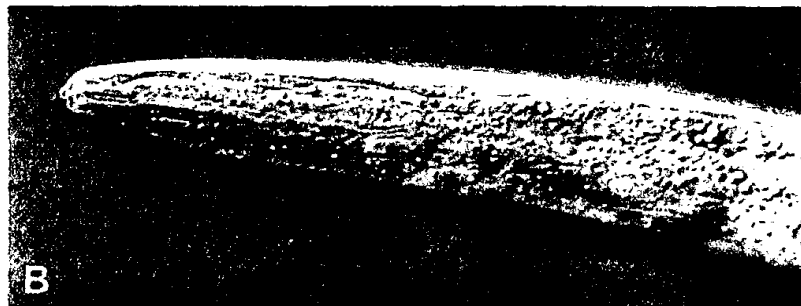
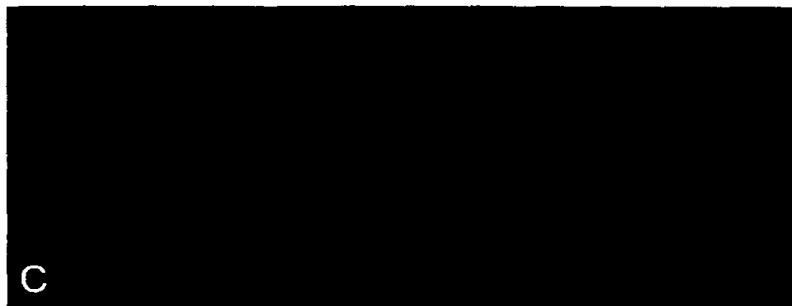


FIG. 6C





COPY OF PAPERS
ORIGINALLY FILED

FIG. 7

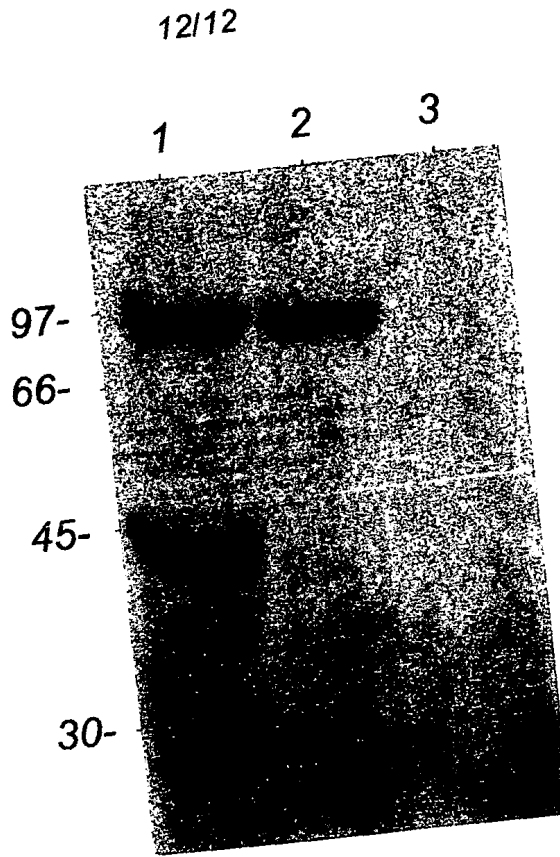


FIG. 8

